Poker Cards Analysis - April 2020

The Directors
GVC Plc

This is to confirm that iTech Labs has examined the game logs for Poker games for the period **April 01, 2020** to **April 30, 2020** as recorded by the respective game servers and analyzed the Poker cards for statistical randomness. The results of the analysis are given below.

URLs: https://www.bwin.be/,https://www.bwin.dk/, https://www.bwin.es/, https://www.bwin.fr/, https://www.bwin.it/, https://www.premiumbull.com/, https://www.bwin.gr/, https://www.bwin.com/, https://www.partypoker.cz/, https://da.partypoker.com/, https://danskespil.dk/, https://www.partypoker.fr/, https://www.giocodigitale.it/, https://www.br.betboo.com/en, https://www.partypremium.com, https://www.partypoker.es/en, https://www.partypoker.com/, https://sports.premium.com/en/sports, https://poker.partypoker.se/sv/poker, https://sports.sportingbet.com/en/sports, https://sports.sportingbet.gr/el/sports, https://www.sh.bwin.de/, https://sports.vistabet.com/el/sports, https://sports.sportingbet.co.za/en/sports

1. Poker hand types statistics

These calculations were done for Royal Flush, Straight Flush, Four of a Kind, Full House, Flush, Straight, 3 of a Kind, 2 pairs, 1 Pair, High Card.

The Poker hand types analysis involved creating subsets of data and conducting Chi-square tests on each subset.

The null hypothesis for the chi-square test is that the observed frequencies of each type of hand matches the theoretical values for a deck that has been shuffled using a perfect random number generator. The p-values observed in these multiple tests are expected to follow a uniform distribution for the range 0.0 to 1.0.

The analysis performs a KS Test (Kolmogorov-Smirnov test) for uniform distribution on the observed p-values, and the combined p-value result of this test is taken as the final result of the Poker hand types statistics tests.

1.1 Poker hand types statistics for 52 cards deck:

Test No.	DOF	ChiSqr	P-Value
1	9	5.74	0.76588
2	9	9.63	0.38091
3	9	9.43	0.39895
4	9	12.18	0.20347
5	9	5.53	0.78547
6	9	14.77	0.09755
7	9	4.36	0.88631
8	9	10.20	0.33475
9	9	19.19	0.02359
10	9	4.42	0.88195
11	9	11.21	0.26166
12	9	7.64	0.57124
13	9	6.93	0.64478
14	9	5.58	0.78133
15	9	6.25	0.71479
16	9	17.60	0.04015
17	9	7.68	0.56696
18	9	9.79	0.36734
19	9	10.63	0.30174
20	9	4.24	0.89527
21	9	6.28	0.71115

22	9	5.58	0.78141
23	9	5.50	0.78827
24	9	14.13	0.11770
25	9	9.60	0.38397
26	9	12.44	0.18949
27	9	6.78	0.66003
28	9	4.13	0.90255
29	9	16.20	0.06283
30	9	12.06	0.21008
31	9	7.98	0.53638
32	9	6.84	0.65384
33	9	6.06	0.73392
34	9	4.79	0.85237
35	9	8.74	0.46116
36	9	12.71	0.17606
37	9	8.24	0.51061
38	9	4.83	0.84852
39	9	14.25	0.11385
40	9	8.97	0.43983
41	9	11.57	0.23892
42	9	9.81	0.36605
43	9	8.66	0.46957
44	9	11.47	0.24459
45	9	9.79	0.36809
46	9	11.70	0.23086
47	9	4.73	0.85700
48	9	12.04	0.21092
49	9	11.39	0.24962
50	9	4.68	0.86103
51	9	14.64	0.10138
52	9	8.69	0.46616
53	9	2.75	0.97342
54	9	2.20	0.98793
55	9	5.67	0.77211
56	9	9.42	0.39970
57	9	7.64	0.57048
58	9	13.74	0.13184
59	9	11.29	0.25634
60	9	5.80	0.75951
61	9	20.49	0.01511
62	9	8.78	0.45762
63	9	6.26	0.71337
64	9	10.63	0.30167
65	9	1.94	0.99239
66	9	5.10	0.82562
67	9	9.71	0.37488
68	9	5.23	0.81365
69	9	19.39	0.02205
70	9	7.04	0.63289
71	9	12.74	0.17488
72	9	7.25	0.61069
73	9	14.12	0.11821
74	9	10.48	0.31295
75	9	7.72	0.56224
76	9	2.96	0.96589

77	9	15.58	0.07622
78	9	8.60	0.47544
79	9	12.77	0.17345
80	9	6.97	0.64019
81	9	5.96	0.74433
82	9	12.31	0.19623
83	9	13.75	0.13160
84	9	6.10	0.73034
85	9	1.71	0.99531
86	9	10.83	0.28734
87	9	16.12	0.06449
88	9	9.41	0.40015
89	9	3.59	0.93644
90	9	7.95	0.53945
91	9	8.69	0.46604
92	9	10.64	0.30091
93	9	11.74	0.22832
94	9	10.41	0.31821
95	9	8.25	0.50917
96	9	2.88	0.96876
97	9	9.79	0.36803
98	9	12.64	0.17953
99	9	7.19	0.61694
100	9	6.01	0.73857
Combined P-value for all tests (Using KS method)			0.85578

Notes:

1) The P-values are observed probabilities from the Chi-Square tests. The last row shows the result of the KS Test performed on the p-values for all Chi-Square tests, where there are sufficient data.

1.2 Poker hand types statistics for 36 cards deck:

Test No.	DOF	ChiSqr	P-Value
1	9	11.25	0.25864
2	9	3.39	0.94666
3	9	13.15	0.15591
4	9	7.92	0.54257
5	9	5.15	0.82093
6	9	11.12	0.26729
7	9	25.01	0.00296
8	9	10.78	0.29105
9	9	15.58	0.07619
10	9	6.25	0.71426
11	9	8.55	0.48012
12	9	6.12	0.72768
13	9	7.21	0.61559
14	9	4.18	0.89895
15	9	6.08	0.73146
16	9	7.16	0.62041
17	9	5.39	0.79941
18	9	10.45	0.31498
19	9	7.64	0.57053
20	9	6.99	0.63804
21	9	11.33	0.25406
22	9	1.37	0.99800

23	9	11.43	0.24730
24	9	7.50	0.58550
25	9	2.73	0.97393
26	9	15.29	0.08325
27	9	7.24	0.61214
28	9	7.20	0.61658
29	9	10.56	0.30738
30	9	9.08	0.42998
31	9	8.91	0.44519
Combined P-value for all tests (Using KS method)			0.75228

Notes:

1) The P-values are observed probabilities from the Chi-Square tests. The last row shows the result of the KS Test performed on the p-values for all Chi-Square tests, where there are sufficient data.

2. Poker rank statistics

The Poker rank analysis aims to establish that the rank of the cards in each position was equally distributed in one of the 13 possible ranks (2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K, A) for a 52 card deck and 9 ranks (6, 7, 8, 9, 10, J, Q, K, A) for a 36 card deck.

The Poker rank analysis involved creating subsets of data and conducting Chi-square tests on each subset. The analysis performs a KS Test (Kolmogorov-Smirnov test) for uniform distribution on the observed p-values, and the combined p-value result of this test is taken as the final result of the Ranks statistics tests.

2.1 Poker rank statistics for 52 cards deck:

Test No.	Positions	DOF	ChiSqr	P-Value
1	7	84	84.54	0.46290
2	7	84	99.14	0.12406
3	7	84	61.38	0.96989
4	7	84	108.09	0.03952
5	7	84	97.26	0.15277
6	7	84	82.03	0.54036
7	7	84	88.04	0.36014
8	7	84	73.34	0.79056
9	7	84	97.15	0.15470
10	7	84	60.06	0.97757
11	7	84	73.64	0.78310
12	7	84	113.01	0.01911
13	7	84	66.65	0.91788
14	7	84	91.38	0.27281
15	7	84	75.94	0.72271
16	7	84	102.26	0.08556
17	7	84	76.21	0.71524
18	7	84	65.56	0.93195
19	7	84	75.38	0.73810
20	7	84	89.82	0.31202
21	7	84	75.43	0.73665
22	7	84	85.17	0.44370
23	7	84	90.97	0.28268
24	7	84	91.45	0.27099
25	7	84	87.62	0.37205
26	7	84	78.07	0.66177

27	7	84	111.06	0.02569
28	7	84	90.64	0.29098
29	7	84	92.99	0.23529
30	7	84	70.12	0.86087
31	7	84	65.83	0.92862
32	7	84	100.82	0.10189
33	7	84	94.79	0.19759
34	7	84	102.20	0.08625
35	7	84	88.79	0.33940
36	7	84	83.40	0.49792
37	7	84	73.98	0.77460
38	7	84	75.96	0.72207
39	7	84	84.42	0.46664
40	7	84	71.69	0.82861
41	7	84	109.21	0.03368
42	7	84	65.71	0.93014
43	7	84	76.39	0.71032
44	7	84	90.79	0.28720
45	7	84	73.33	0.79059
46	7	84	59.77	0.97904
47	7	84	69.35	0.87514
48	7	84	81.58	0.55438
49	7	84	89.96	0.30840
50	7	84	63.42	0.95418
51	7	84	89.93	0.30910
52	7	84	79.53	0.61782
53	7	84	107.41	0.04351
54	7	84	79.19	0.62811
55	7	84	95.99	0.17478
56	7	84	77.38	0.68185
57	7	84	88.95	0.33510
58	7	84	60.41	0.97570
59	7	84	89.67	0.31599
60	7	84	66.08	0.92544
61	7	84	82.58	0.52339
62	7	84	83.15	0.50569
63	7	84	78.96	0.63505
64	7	84	91.86	0.26122
65	7	84	85.73	0.42703
66	7	84	108.63	0.03665
67	7	84	92.59	0.24436
68	7	84	96.83	0.16006
69	7	84	77.52	0.67780
70	7	84	80.10	0.60033
71	7	84	85.78	0.42564
72	7	84	94.18	0.20996
73	7	84	96.59	0.16408
74	7	84	70.42	0.85498
75	7	84	79.13	0.62975
76	7	84	88.40	0.35013
77	7	84	123.71	0.00315
78	7	84	75.43	0.73673
79	7	84	93.00	0.23504
80	7	84	101.65	0.09220
81	7	84	79.46	0.61986

82	7	84	99.51	0.11882
83	7	84	101.63	0.09245
84	7	84	98.26	0.13693
85	7	84	85.67	0.42893
86	7	84	68.96	0.88208
87	7	84	85.23	0.44201
88	7	84	98.99	0.12610
89	7	84	88.01	0.36101
90	7	84	67.19	0.91034
91	7	84	99.76	0.11553
92	7	84	61.53	0.96895
93	7	84	85.63	0.43012
94	7	84	95.41	0.18558
95	7	84	87.31	0.38076
96	7	84	89.51	0.32026
97	7	84	76.07	0.71905
98	7	84	81.45	0.55864
99	7	84	82.62	0.52225
100	7	84	101.51	0.09384
Combined P-value for all tests (Using KS method)				0.53964

Notes:

1) The P-values are observed probabilities from the Chi-Square tests. The last row shows the result of the KS Test performed on the p-values for all Chi-Square tests, where there are sufficient data.

2.2 Poker rank statistics for 36 cards deck:

Test No.	Positions	DOF	ChiSqr	P-Value
1	7	56	52.33	0.61439
2	7	56	49.16	0.72942
3	7	56	67.33	0.14280
4	7	56	59.76	0.34083
5	7	56	62.89	0.24547
6	7	56	65.21	0.18709
7	7	56	57.62	0.41510
8	7	56	72.45	0.06869
9	7	56	65.39	0.18299
10	7	56	56.54	0.45461
11	7	56	50.26	0.69076
12	7	56	65.20	0.18715
13	7	56	54.06	0.54864
14	7	56	54.50	0.53191
15	7	56	35.49	0.98530
16	7	56	58.07	0.39897
17	7	56	69.36	0.10824
18	7	56	56.20	0.46728
19	7	56	70.24	0.09549
20	7	56	66.53	0.15848
21	7	56	47.69	0.77753
22	7	56	52.45	0.61002
23	7	56	70.72	0.08911
24	7	56	51.13	0.65921
25	7	56	44.47	0.86659
26	7	56	49.89	0.70418
27	7	56	35.55	0.98502
28	7	56	64.43	0.20544

29	7	56	45.38	0.84393
30	7	56	62.93	0.24434
31	7	56	60.30	0.32308
32	7	56	40.75	0.93742
33	7	56	47.37	0.78741
34	7	56	49.11	0.73100
35	7	56	62.43	0.25834
36	7	56	50.29	0.69003
37	7	56	50.07	0.69772
38	7	56	47.95	0.76948
39	7	56	46.87	0.80258
40	7	56	38.25	0.96655
41	7	56	42.55	0.90747
42	7	56	62.90	0.24526
43	7	56	51.24	0.65542
44	7	56	56.95	0.43958
45	7	56	75.30	0.04366
46	7	56	45.28	0.84653
47	7	56	56.05	0.47316
48	7	56	49.13	0.73047
49	7	56	71.08	0.08448
50	7	56	51.81	0.63431
51	7	56	50.62	0.67799
52	7	56	55.72	0.48555
53	7	56	47.83	0.77299
54	7	56	33.14	0.99356
55	7	56	36.27	0.98117
56	7	56	75.52	0.04210
57	7	56	68.80	0.11709
58	7	56	57.32	0.42602
59	7	56	56.76	0.44641
60	7	56	66.02	0.16910
61	7	56	50.97	0.66506
62	7	56	60.11	0.32925
63	7	56	47.29	0.79000
64	7	56	73.15	0.06166
65	7	56	73.17	0.06149
66	7	56	62.95	0.24385
67	7	56	43.33	0.89197
68	7	56	60.38	0.32043
69	7	56	58.05	0.39948
70	7	56	73.57	0.05774
71	7	56	46.15	0.82328
72	7	56	77.13	0.03212
73	7	56	43.79	0.88208
74	7	56	57.96	0.40277
75	7	56	61.77	0.27752
76	7	56	66.56	0.15786
77	7	56	44.36	0.86924
78	7	56	55.11	0.50839
79	7	56	53.07	0.58653
80	7	56	61.61	0.28221
81	7	56	78.62	0.02479
82	7	56	48.45	0.75303
83	7	56	49.98	0.70107

84	7	56	55.69	0.48672
85	7	56	58.16	0.39588
86	7	56	52.06	0.62489
87	7	56	50.65	0.67689
88	7	56	39.17	0.95728
89	7	56	68.75	0.11791
90	7	56	75.90	0.03952
91	7	56	51.91	0.63021
92	7	56	63.68	0.22456
93	7	56	42.69	0.90475
94	7	56	54.70	0.52426
95	7	56	39.01	0.95905
96	7	56	47.67	0.77822
97	7	56	40.61	0.93941
98	7	56	59.05	0.36474
99	7	56	43.38	0.89097
100	7	56	60.68	0.31100
Combined P-value for all tests (Using KS method)				0.85347

Notes:

1) The P-values are observed probabilities from the Chi-Square tests. The last row shows the result of the KS Test performed on the p-values for all Chi-Square tests, where there are sufficient data.

3. Poker suits statistics

The Poker suits analysis aims to verify that that the cards dealt exhibit an equal probability of all 4 suits (Clubs, Diamonds, Hearts and Spades) in all positions.

The Poker suits analysis involved creating subsets of data and conducting Chi-square tests on each subset. The analysis performs a KS Test (Kolmogorov-Smirnov test) for uniform distribution on the observed p-values, and the combined p-value result of this test is taken as the final result of the Suits statistics tests.

3.1 Poker suits statistics for 52 cards deck:

Test No.	Positions	DOF	ChiSqr	P-Value
1	7	21	37.06	0.01657
2	7	21	18.52	0.61617
3	7	21	18.80	0.59826
4	7	21	21.77	0.41276
5	7	21	20.98	0.46032
6	7	21	29.95	0.09290
7	7	21	15.51	0.79671
8	7	21	18.27	0.63178
9	7	21	14.48	0.84804
10	7	21	20.27	0.50421
11	7	21	14.06	0.86721
12	7	21	17.49	0.68125
13	7	21	15.51	0.79656
14	7	21	20.25	0.50561
15	7	21	28.73	0.12055
16	7	21	25.59	0.22246
17	7	21	17.48	0.68188
18	7	21	22.79	0.35551
19	7	21	22.06	0.39594
20	7	21	23.96	0.29499
21	7	21	24.62	0.26420
22	7	21	24.69	0.26106

23	7	21	19.91	0.52671
24	7	21	21.19	0.44763
25	7	21	21.30	0.44057
26	7	21	15.10	0.81806
27	7	21	32.26	0.05513
28	7	21	11.09	0.96091
29	7	21	20.54	0.48737
30	7	21	20.69	0.47779
31	7	21	18.65	0.60736
32	7	21	9.22	0.98734
33	7	21	18.50	0.61713
34	7	21	15.29	0.80835
35	7	21	14.91	0.82735
36	7	21	21.03	0.45709
37	7	21	23.72	0.30693
38	7	21	11.43	0.95386
39	7	21	17.93	0.65360
40	7	21	23.02	0.34295
41	7	21	15.76	0.78290
42	7	21	17.74	0.66535
43	7	21	25.98	0.20732
44	7	21	25.03	0.24601
45	7	21	12.74	0.91756
46	7	21	14.34	0.85454
47	7	21	23.46	0.31982
48	7	21	22.02	0.39808
49	7	21	18.79	0.59885
50	7	21	17.68	0.66890
51	7	21	21.79	0.41151
52	7	21	19.87	0.52947
53	7	21	22.65	0.36296
54	7	21	20.79	0.47180
55	7	21	24.03	0.29180
56	7	21	35.35	0.02586
57	7	21	12.67	0.91972
58	7	21	11.97	0.94033
59	7	21	11.82	0.94429
60	7	21	32.65	0.05027
61	7	21	22.15	0.39087
62	7	21	24.67	0.26192
63	7	21	23.34	0.32619
64	7	21	18.95	0.58855
65	7	21	28.54	0.12550
66	7	21	21.56	0.42534
67	7	21	19.78	0.53499
68	7	21	19.55	0.54994
69	7	21	21.06	0.45522
70	7	21	14.45	0.84965
71	7	21	27.52	0.15436
72	7	21	16.56	0.73725
73	7	21	17.14	0.70260
74	7	21	11.16	0.95967
75	7	21	13.25	0.89951
76	7	21	14.43	0.85060
77	7	21	21.46	0.43116

78	7	21	15.47	0.79889
79	7	21	12.57	0.92307
80	7	21	23.11	0.33836
81	7	21	24.76	0.25776
82	7	21	34.45	0.03239
83	7	21	15.67	0.78786
84	7	21	15.08	0.81904
85	7	21	12.92	0.91138
86	7	21	15.10	0.81796
87	7	21	30.80	0.07701
88	7	21	17.91	0.65474
89	7	21	18.08	0.64370
90	7	21	15.82	0.77995
91	7	21	24.40	0.27428
92	7	21	17.38	0.68785
93	7	21	18.98	0.58616
94	7	21	23.40	0.32281
95	7	21	16.13	0.76231
96	7	21	25.77	0.21525
97	7	21	19.88	0.52912
98	7	21	20.60	0.48344
99	7	21	12.75	0.91727
100	7	21	15.76	0.78293
Combined P-value for all tests (Using KS method)				0.11605

Notes:

1) The P-values are observed probabilities from the Chi-Square tests. The last row shows the result of the KS Test performed on the p-values for all Chi-Square tests, where there are sufficient data.

3.2 Poker suits statistics for 36 cards deck:

Test No.	Positions	DOF	ChiSqr	P-Value
1	7	21	16.58	0.73606
2	7	21	14.81	0.83235
3	7	21	22.81	0.35399
4	7	21	22.35	0.37935
5	7	21	41.40	0.00500
6	7	21	28.03	0.13944
7	7	21	12.89	0.91254
8	7	21	25.87	0.21137
9	7	21	16.87	0.71918
10	7	21	16.54	0.73848
11	7	21	11.33	0.95601
12	7	21	20.50	0.48978
13	7	21	14.01	0.86901
14	7	21	25.25	0.23639
15	7	21	21.25	0.44389
16	7	21	19.23	0.57019
17	7	21	19.55	0.55007
18	7	21	17.31	0.69189
19	7	21	21.04	0.45643
20	7	21	26.69	0.18130
21	7	21	20.16	0.51093
22	7	21	24.15	0.28592
23	7	21	29.95	0.09296
24	7	21	23.96	0.29483

25	7	21	16.64	0.73268
26	7	21	16.11	0.76333
27	7	21	31.36	0.06789
28	7	21	25.70	0.21805
29	7	21	41.82	0.00443
30	7	21	17.98	0.65009
31	7	21	12.00	0.93949
32	7	21	15.72	0.78498
33	7	21	12.95	0.91049
34	7	21	25.96	0.20780
35	7	21	22.05	0.39662
36	7	21	12.00	0.93965
37	7	21	20.85	0.46826
38	7	21	9.21	0.98745
39	7	21	20.53	0.48779
40	7	21	17.52	0.67936
41	7	21	15.04	0.82111
42	7	21	24.71	0.26016
43	7	21	19.30	0.56616
44	7	21	17.20	0.69863
45	7	21	21.10	0.45303
46	7	21	15.02	0.82186
47	7	21	13.02	0.90778
48	7	21	29.73	0.09752
49	7	21	20.19	0.50942
50	7	21	14.63	0.84101
51	7	21	19.22	0.57092
52	7	21	15.78	0.78185
53	7	21	12.76	0.91668
54	7	21	15.97	0.77145
55	7	21	23.74	0.30574
56	7	21	16.99	0.71159
57	7	21	25.13	0.24147
58	7	21	27.69	0.14926
59	7	21	23.12	0.33779
60	7	21	13.57	0.88734
61	7	21	24.57	0.26610
62	7	21	11.93	0.94148
63	7	21	30.32	0.08570
64	7	21	17.32	0.69154
65	7	21	17.97	0.65103
66	7	21	17.92	0.65413
67	7	21	27.66	0.15018
68	7	21	22.83	0.35300
69	7	21	23.68	0.30907
70	7	21	18.28	0.63129
71	7	21	20.83	0.46931
72	7	21	23.64	0.31098
73	7	21	15.24	0.81067
74	7	21	9.84	0.98098
75	7	21	21.03	0.45699
76	7	21	13.42	0.89305
77	7	21	11.33	0.95597
78	7	21	19.39	0.56001
79	7	21	25.42	0.22943

80	7	21	22.15	0.39114
81	7	21	14.58	0.84352
82	7	21	22.85	0.35181
83	7	21	10.12	0.97738
84	7	21	17.08	0.70637
85	7	21	31.45	0.06652
86	7	21	31.77	0.06182
87	7	21	32.00	0.05852
88	7	21	9.79	0.98156
89	7	21	16.44	0.74433
90	7	21	15.80	0.78106
91	7	21	20.92	0.46384
92	7	21	30.92	0.07498
93	7	21	17.85	0.65835
94	7	21	18.61	0.61046
95	7	21	12.43	0.92731
96	7	21	19.96	0.52399
97	7	21	29.42	0.10437
98	7	21	21.52	0.42761
99	7	21	22.95	0.34681
100	7	21	22.87	0.35112
Combined P-value for all tests (Using KS method)				0.52574

Notes:

1) The P-values are observed probabilities from the Chi-Square tests. The last row shows the result of the KS Test performed on the p-values for all Chi-Square tests, where there are sufficient data.

4. Summary of the analysis

4.1 Summary of the analysis of 52 cards deck:

The analysis of 52 cards completes by combining the result of the KS Test performed in the 3 types of analysis (Hand Types, Ranks and Suits) for 52 card decks using the Holm's method and producing a single Combined P -value.

The combined p-value produced using the Holm's method is used as indication for statistical randomness.

Combination of p-values using Holm's Method		
Test	**P-Value**	**P-Adjusted**
Ranks Test	0.53964	1.00000
Suits Test	0.11605	0.34815
Hand Types Test	0.85578	1.00000
Combined P-Value using Holm's Method		0.34815

Notes:

1) The combined p-value of all statistical tests using Holm's Method conducted for 52 card decks is greater than the minimum value of 0.05 which indicates that the randomness of the observed data falls within 95% confidence limits.

The final outcome of the analysis of 52 cards deck indicates that the RNG is working correctly.

4.2 Summary of the analysis of 36 cards deck:

The analysis of 36 cards completes by combining the result of the KS Test performed in the 3 types of analysis (Hand Types, Ranks and Suits) for 36 card decks using the Holm's method and producing a single Combined P -value. Where there are insufficient data the individual Chi-Square tests results are used in the Holm's method for producing a combined p-value.

The combined p-value produced from the using the Holm's method is used as indication for statistical randomness.

Combination of p-values using Holm's Method		
Test	**P-Value**	**P-Adjusted**
Ranks Test	0.85347	1.00000
Suits Test	0.52574	1.00000
Hands Type Test	0.75228	1.00000
Combined P-Value using Holm's Method		1.00000

Notes:

1) The combined p-value of all statistical tests using Holm's Method conducted for 36 card decks is greater than the minimum value of 0.05 which indicates that the randomness of the observed data falls within 95% confidence limits.

The final outcome of the analysis of 36 cards deck indicates that the RNG is working correctly.

5. Conclusion

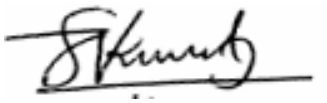
Analysis of actual data from game logs for 'Hand Types, 'Ranks' and 'Suits' for **52-card decks** and **36-card decks** indicated statistical randomness.

iTech Labs has done limited sanity checks to verify the integrity of the game logs. iTech Labs also maintains a copy of the game logs for verification purposes. There were a large enough number of game records to give the calculations sufficient statistical power.

We conclude that the Random Number Generator (RNG) is working correctly.

Please click here to see the Original report.

Signed:



Kiren Sreekumar
Principal Consultant
iTech Labs Australia
Date: 28 May, 2020

Signed:

Geoff Nicoll
Principal Consultant
iTech Labs Australia
Date: 28 May, 2020

Disclaimer.
While it is not possible to test all possible scenarios in a laboratory environment, iTech Labs has conducted a level of testing appropriate for a component test of this type.